



## Algebraic Formulas

### Linear Formulas:

$$y = mx + b \text{ (Slope-Intercept Form)}$$

$$y - y_1 = m(x - x_1) \text{ (Point-Slope)}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} \text{ (Slope of a line)}$$

$$M = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \text{ (Midpoint)}$$

$$Ax + By = C \text{ (Standard Form)}$$

Distance between two points

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

### Factoring Formulas:

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(a - b)^2 = a^2 - 2ab + b^2$$

$$a^2 - b^2 = (a - b)(a + b)$$

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$



## Miscellaneous Formulas

### Temperature Formulas:

$$F = \frac{9}{5}C + 32$$

$$C = \frac{5}{9}(F - 32)$$

### Interest Formulas:

$$I = Prt \quad \text{(Simple Interest)}$$

$$B = P\left(1 + \frac{r}{n}\right)^{nt} \text{ (Compound Interest)}$$

$$B = Pe^{rt} \text{ (Cont. Compound Interest)}$$

### Growth and Decay Formulas:

$$Q(t) = Q_0 e^{kt} \text{ (Exponential Growth)}$$

$$Q(t) = Q_0 e^{-kt} \text{ (Exponential Decay)}$$

### Counting Formulas:

$$n! = n * (n - 1) * (n - 2) * \dots * 2 * 1$$

$${}^n C_r = \frac{n!}{r!(n-r)!} \quad {}^n P_r = \frac{n!}{(n-r)!}$$